

REMARKS

This Amendment is in response to the Office Action dated September 21, 2005. Claims 25 and 26 have been added. Claims 1-26 are presently pending. No new matter has been added.

§103 Rejections

Claims 1, 4, 6-10, 13, 15, and 17-21 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,252,892 to Jiang et al. (“Jiang”) in view of U.S. Patent No. 4,854,676 to Kalyanaraman et al. (“Kalyanaraman”) and U.S. Patent No. 5,802,083 to Birnbaum (“Birnbaum”) and further in view of U.S. Patent No. 5,345,454 to Keller (“Keller”). Claims 2, 3, 14, and 24 were rejected under 35 U.S.C. §103(a) as being unpatentable over Jiang in view of Kalyanaraman, Birnbaum, and Keller and further in view of U.S. Patent No. 5,175,664 to Diels et al. (“Diels”). Claim 5 and 16 were rejected under 35 U.S.C. §103(a) as being unpatentable over Jiang in view of Kalyanaraman, Birnbaum, and Keller and further in view of U.S. Patent No. 4,980,566 to Heilweil (“Heilweil”). Claims 11 and 22 were rejected under 35 U.S.C. §103(a) as being unpatentable over Jiang in view of Kalyanaraman, Birnbaum, and Keller and further in view of U.S. Patent No. 6,002,697 to Govorkov et al. (“Govorkov”). Claims 12 and 23 were rejected under 35 U.S.C. §103(a) as being unpatentable over Jiang in view of Kalyanaraman, Birnbaum, and Keller and further in view of U.S. Patent No. 4,833,333 to Rand (“Rand”). The Applicant traverses these rejections.

Independent claims 1 and 13 recite a laser comprising a saturable absorber (SA) element arranged along a beam pathway for Q-switching the laser, said SA element having an absorption recovery time which is longer than an output pulse duration. This describes a “slow” saturable absorber.

Jiang does not teach or suggest a laser having a slow SA element. Jiang’s resonant Fabry-Perot saturable absorber (R-PFSA) is fast. In a fast SA element, the lifetime of the carriers in the SA element is less than the time required for laser energy to make a roundtrip of the cavity. In

Jiang, the lifetime of the carriers is 5 picoseconds (Col. 9, lines 37-42), while the time for laser energy to make a roundtrip of the cavity is on the order of 10-100 nanoseconds (Col. 5, lines 23-26). Jiang's R-PFSA is thus fast, not slow.

Jiang also teaches directly away from Q-switching a laser, specifically teaching the use of a fast, two-photon absorber (TPA) to suppress Q-switching and promote cw modelocking. (Abstract and Col. 6, lines 50-55.)

Birnbaum is not capable of combination with Jiang. Jiang specifically teaches the suppression of Q-switching to promote cw modelocking and only discloses a fast SA. Birnbaum, on the other hand, is directed to Q-switching and slow saturable absorbers. There is no teaching or suggestion in any of the cited references to combine these two disparate references, Jiang and Birnbaum. In fact, Jiang teaches away from doing what is described in Birnbaum. Therefore, the Office Action fails to meet a fundamental requirement for establishing a *prima facie* case of obviousness; namely, a teaching or suggestion to combine or modify the references. (M.P.E.P. §2143.) The present Office Action "picks and chooses" elements from multiple references with little regard for compatibility of the references or whether the references suggest the combination/modification.

Moreover, as indicated at M.P.E.P. §2143.01, "the proposed modification cannot render cannot change the principle of operation of a reference." The Office Action's proposed modification of Jiang in view of Birnbaum, however, does exactly what is prohibited. The proposed modification of Jiang would change the very principle of Jiang, which is the use of a fast SA to suppress Q-switching. Accordingly, neither Jiang nor Birnbaum, alone teaches or suggests the present claims.

Kalyanaraman also teaches a fast SA that is composed of a solid dye solution. (Col. 1, line 64 to Col. 2, line 3 and lines 55-65.) Kalyanaraman does not address the deficiencies of Jiang and Birnbaum. Moreover, Kalyanaraman is provided, according to the Office Action, to suggest a pulse power range and pulse duration. There is no support in the Office Action to substantiate that

the pulse power range and pulse duration of Kalyanaraman would be applicable to the laser of Jiang which is made of different components. Thus, there is no teaching or suggestion to support the proposed modification of Jiang in view of Kalyanaraman.

With respect to Keller, the Office Action asserts that “Keller discloses that the orientation of the SA element can be selected to be one of a plurality of orientations between a first and a second angle approximately 45 degrees to a polarization of the beam in the beam pathway.” The Office Action cites Figure 4 and Col. 5, line 59 to Col. 6, line 31 of Keller for this assertion.

The Applicant respectfully submits that this assertion is incorrect and unsupported by Keller. In particular, Figure 4 of Keller shows the saturable absorber (reference no. 112 in the specification and reference no. 12 in Figure 4) as being positioned so that the laser light 111 is normally incident on the saturable absorber. Therefore, the orientation of the SA is such that the angle between the SA element and the polarization of the light beam (which is orthogonal to the direction of light propagation) is 0 degrees. Keller does suggest that the folding angle θ_2 can be varied, but in each case, the saturable absorber will be positioned so that the light is normally incident. There is no teaching or suggestion that the angle of incidence with respect to the saturable absorber is anything other than normal.

None of the other cited references address the deficiencies of Jiang, Birnbaum, Kalyanaraman, and Keller. Accordingly, none of the references, alone or in combination, teach or suggest all of the claim elements. For at least these reasons, claims 1 and 13, as well as dependent claims 2-12 and 14-24, are patentable over the cited references. The Applicant respectfully requests withdrawal of the rejections of these claims.

Double Patenting Rejection

Claim 1-6 and 10-13 were provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 3, 6, 7, 8, 14, 29, 34, and 40 of U.S. Patent No. 6,546,027. The Applicant traverses this rejection.

The Office Action asserts that claim 1 of U.S. Patent No. 6,546,027, discloses the following elements of the present claims: "wherein at least one of an orientation and a location of the SA element is variable" and "wherein the output pulse duration of can be varied by varying at least one of the orientation and location of the SA element." This assertion is incorrect.

None of the cited claims of the '027 patent teach or suggest these claim elements. If this rejection is maintained, the Applicant respectfully requests that reasoning be provided to explain why the recited claim elements are obvious in view of the claims of the '027 patent, which do not teach or suggest such claim elements. Otherwise, the Applicant respectfully requests that this rejection of claims 1-6 and 10-13 be withdrawn.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

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Respectfully submitted,

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